Small Business Innovation Research/Small Business Tech Transfer

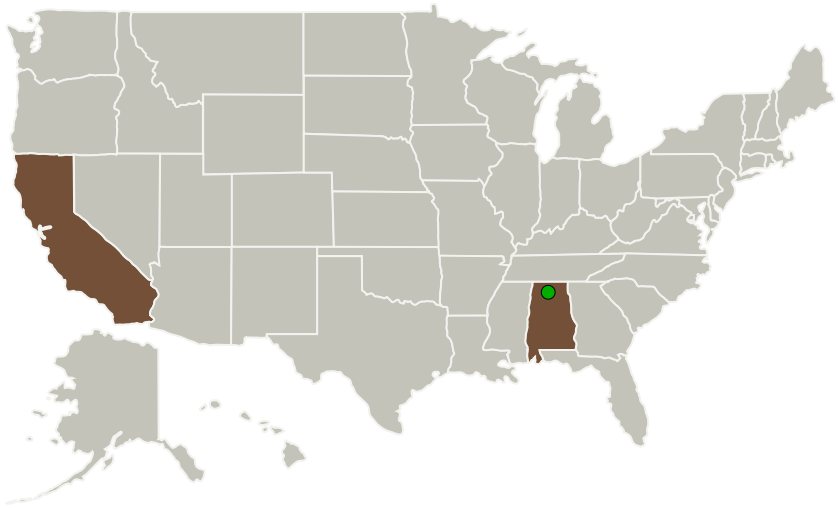
Rad Hard Non Volatile Memory for FPGA BootLoading, Phase I

Completed Technology Project (2013 - 2013)

Project Introduction

Radiation-hardened non volatile memory is needed to store the golden copy of the image(s) has not kept pace with the advances in FPGAs. Consider that a single image of a Xilinx V5 typically is roughly 50 Mb large. If a designer wants to store several such images in a satellite, then a sizable amount of highly reliable, radiation-hardened memory is needed. As a consequence, there exists a clear need and market opportunity for highly reliable NVM for storing program code, calibration tables and images of reprogrammable FPGAs. The goal of this SBIR project is to develop a highly reliable and fault-tolerant, radiation-hardened Memory System-In-a-Package (Memory SIP) which can be used to configure and scrub reconfigurable FPGAs. The Memory SIP will contain a simple radiation-hardened microcontroller and a reasonable amount of commercial flash nonvolatile memory (NVM). It will support the needed standard interfaces that are commonly used for reconfiguring FPGAs, including Xilinx SelectMAP and JTAG.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
Space Micro, Inc.	Lead Organization	Industry	San Diego, California
Marshall Space Flight Center(MSFC)	Supporting Organization	NASA Center	Huntsville, Alabama

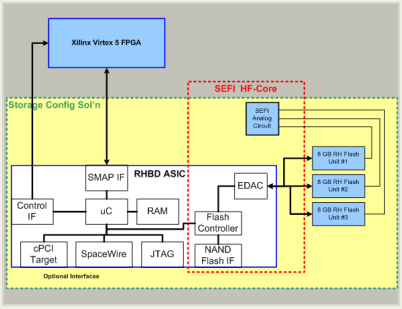


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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

Rad Hard Non Volatile Memory for FPGA BootLoading, Phase I

Completed Technology Project (2013 - 2013)

Primary U.S. Work Locations	
Alabama	California

Project Transitions

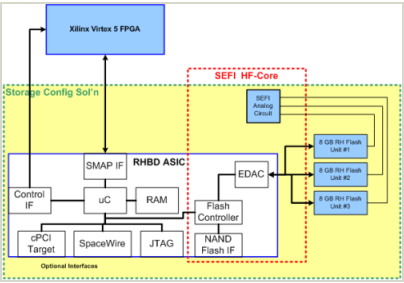
May 2013: Project Start

November 2013: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140409)*

Images



Project Image
Rad hard Non volatile memory for FPGA boot loading *(https://techport.nasa.gov/image/136512)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Space Micro, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Bert R Vermeire

Co-Investigator:

Bert Vermeire

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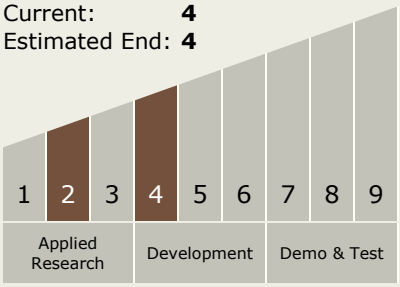
Completed Technology Project (2013 - 2013)

Technology Maturity (TRL)

Start: **2**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX02 Flight Computing and Avionics
  - TX02.1 Avionics Component Technologies
    - TX02.1.1 Radiation Hardened Extreme Environment Components and Implementations

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System